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The cauchy problem for the helmholtz equation in a domain with a piecewise-smooth boundary

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Abstract

The Cauchy problem for the Helmholtz equation is investigated in the case when a piecewise-smooth boundary of a domain is determined in a parametric form. The condition at infinity is taken in the form of the absence of in-coming waves from infinity. The formula that expresses a Fourier image solution through its boundary values is obtained by using the Fourier transformation method in a class of slowly-growing generalized functions. The conditions that the boundary values of the functions have to satisfy are derived. It is proven that these conditions are the necessary and sufficient solvability conditions for the original problem. © 2006 IEEE.